

Patent Application

for

ELECTRICAL LIGHTING FIXTURE WITH SUSPENSION ASSEMBLY

by

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**Cross-Reference to Related Application**

**[0001]** This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Application Serial No. 60/459,261, filed April 2, 2003, which is hereby incorporated by reference in its entirety.

**Field of the Invention**

**[0002]** The present invention relates to an electrical lighting fixture with a suspension assembly. More specifically, the suspension assembly includes a retention tongue that facilitates engagement of the lighting fixture with cables suspended from a ceiling or beam. Still more particularly, the suspension assembly of the present invention is adapted to receive support cables without modifying or disassembling the lighting fixture.

### **Background of the Invention**

**[0003]** Conventional lighting fixtures for retail and industrial applications are often installed or mounted by being suspended from a ceiling. Such installation of conventional lighting fixtures requires multiple steps including engagement of cables at either end of the fixture housing using a conventional fastener and subsequently attaching the cables to the ceiling. Access to the interior of the lighting fixture housing must be provided to attach the cables to each fixture end. More specifically, the ends of the fixture are removed allowing access to the cables extending through the housing top wall, and the cable ends are fastened to the housing. Subsequent to assembling the cables with each end of the lighting fixture, the fixture ends are reattached and the cables are mounted to the ceiling, thereby suspending the fixture.

**[0004]** Examples of conventional suspended lighting fixtures include U.S. Patent Nos. 6,530,674 to Grierson et al., 5,658,066 to Hirsch, and 4,726,781 to Bernhart et al., the subject matter of each of which is hereby incorporated by reference.

**[0005]** A need exists for an improved suspension assembly for a lighting fixture.

### **Summary of the Invention**

**[0006]** Accordingly, an object of the present invention is to provide a lighting fixture that is easily suspended from a ceiling or beam in one step.

**[0007]** Another object of the present invention is to provide a lighting fixture with a suspension assembly that engages cables subsequent to suspending the cables from a support, such as a ceiling.

**[0008]** Yet another object of the present invention is to provide a lighting fixture that may be suspended from a support without the need for additional suspension or mounting parts, modification of the fixture, or disassembly of the lighting fixture.

**[0009]** The foregoing objects are basically attained by providing a lighting fixture, including an elongated housing supporting at least one lamp and including a wall and an opening opposite the wall, the wall having a first tongue formed therein; and a first suspension cable coupled with the housing, the suspension cable including opposite first and second ends, the first end of the suspension cable having a loop engaging the

first tongue of the wall of the housing and the second end of the suspension cable adapted to engage a support to suspend the housing from the support.

**[0010]** The foregoing objects are also attained by providing a lighting fixture, including an elongated housing supporting first and second lamps and including a wall, an opening opposite the wall, and first and second reflectors for directing light from the lamps through the opening, the wall including opposing ends with first and second tongues formed therein, respectively; and first and second suspension cables coupled with the housing, each of the first and second suspension cables including opposite first and second ends, each of the first ends of the suspension cables having a loop engaging said first and second tongues, respectively, of said wall of said housing and said second ends of said suspension cables being adapted to engage a support to suspend the housing from the support.

**[0011]** The foregoing objects are also attained by a method of suspending a lighting fixture from a support, the lighting fixture including a housing supporting at least one lamp and having opposite first and second end caps, including the steps of inserting a first end of a first suspension cable between a wall of the housing of the lighting fixture and one of the first and second end caps; looping the first end of the first suspension cable around a first suspension member formed in the wall of the housing; and coupling a second end of the first suspension cable opposite the first end with a support thereby suspending the lighting fixture from the support by the first suspension cable.

**[0012]** Other objects, advantages and salient features of the invention will become apparent from the following detailed description, which, taken in conjunction with annexed drawings, discloses a preferred embodiment of the present invention.

#### **Brief Description of the Drawings**

**[0013]** Referring to the drawings which form a part of this disclosure:

**[0014]** FIG. 1 is a perspective view of a lighting fixture in accordance with an embodiment of the present invention, showing the lighting fixture suspended from a support;

**[0015]** FIG. 2 is an enlarged partial perspective view of the lighting fixture of FIG. 1, showing a suspension member before being connected to the lighting fixture;

**[0016]** Fig. 3 is an enlarged partial perspective view of the lighting fixture of FIG. 2, showing the suspension member connected to the lighting fixture;

**[0017]** FIG. 4 is an elevational view in cross section along a longitudinal line of the lighting fixture of FIG. 3;

**[0018]** FIG. 5 is a top plan view of the lighting fixture of FIG. 1;

**[0019]** FIG. 6 is an end elevational view of the lighting fixture of FIG. 1 with the end cap removed, showing the interior of the fixture.

#### **Detailed Description of the Invention**

**[0020]** Referring to the FIGS. 1 - 6, a lighting fixture 10 in accordance with the present invention generally includes a decorative housing 12 that receives first and second parabolic louvers 14 and 16 formed of highly reflective material and that supports first and second lamps 18 and 20. Lamps 18 and 20 are preferably fluorescent. Lighting fixture 10 can be suspended from a support 22, such as a ceiling or beam, by suspension cables 24, 26 and 28. Suspension members 30 and 32 formed in fixture housing 12 facilitate engagement of the lighting fixture 10 with suspension cables 24, 26 and 28 without requiring additional suspension or mounting parts, modification of the fixture, or disassembly of the fixture. Also, louvers 14 and 16 and lamps 18 and 20 provide energy savings, excellent lumen maintenance, higher maintained lumens per watt, precise light distribution and control, and instant restrike and superior color rendering. Preferably, the housing is made of steel. The louvers are preferably made of an anodized aluminum.

**[0021]** As shown in FIGS. 1 and 5, the housing 12 is elongated and has a top wall 34, first and second side walls 36 and 38 extending from the top wall 34, and first and second end walls or caps 40 and 42. Lamps 18 and 20 are supported within the housing 12 between the top wall 34 and the side walls 36 and 38, as shown in FIG. 5. Each of the side walls 36 and 38 has a stepped portion 44 and 45, respectively, defining an inner ballast compartment 46 disposed above louvers 14 and 16, as shown

in FIG. 4. Stepped portions 44 and 45 of the side walls 36 and 38 may include a plurality of slots 48, as shown in Fig. 5, allowing uplighting from lamps 18 and 20 through the top wall 34. For example, two aligned rows of slots 48 may be disposed in stepped portions 44 and 45 adjacent the central ballast compartment 46, as shown in FIG. 5.

**[0022]** As shown in FIG. 1, first and second suspension members 30 and 32 of lighting fixture 10 are formed in the top wall 34 near each end cap 40 and 42, respectively, for engaging suspension cables 24 and 26. First and second suspension members 30 and 32 are substantially identical, so reference will be made to only the first suspension member 30. The first suspension member 30 has a tongue 31, including opposite sides 50 and 51 and a distal end 52 extending between sides 50 and 51, as shown in FIGS. 2 and 3. First suspension member 30 may be formed integrally with the top wall 34 or may be separately formed and attached to the top wall. First and second slots 54 and 55 are formed adjacent sides 50 and 51 of the first suspension member 30, and a third slot 57 is formed between distal end 52 of the tongue 31 and the end cap 40, as shown in FIGS. 2 and 3. The end cap 40 includes a tab 56 that extends above the top wall 34 and over the distal end 52 of the tongue 31 of the suspension member 30, as shown in FIGS. 1 - 4. A vertical gap 60 is defined between the tongue 31 and the tab 56 of the end cap 40, as shown in FIG. 4. Any number of suspension members 30 and 32 may be formed in the housing top wall 34 and disposed anywhere in the top wall. Alternative suspension members may be used with the lighting fixture 10, such as a central hook 62 disposed in the top wall 34 for engaging suspension cable 28, as shown in FIG. 1.

**[0023]** Suspension cables 24, 26 and 28 engage a suspension member at a first end and a support 22 at a second end, as shown in FIGS. 1 - 6. Each suspension cable 24, 26 and 28 has a first end 64, 65 and 67 for engaging suspension members 30, 32 and 62 and an opposite second end 66, 69 and 63 for engaging the support 22. Each first end 64 and 67 of cables 24 and 26 includes a loop 68 and 71 for looping around tongues 31 of suspension members 30 and 32 of fixture housing 12, as shown in FIGS. 1 and 3. The loops 68 and 71 may be preformed in the cable.

**[0024]** Similarly, the first end 65 of suspension cable 28 forms a loop 70 that engages a hook 62 on the top wall 34 of the housing 12. The loop 70 may be formed using a tether 72 or other tying device, as seen in FIG. 1. The tether 72 includes a cable entrance passageway 74 and a cable exit passageway 76. The first end 65 of cable 28 is inserted through the cable entrance passageway 74 and back through the cable exit passageway 76, thereby creating loop 70. The tether 72 locks loop 70 in place via a one-way lock (not shown). An adjustment tool (not shown) may be inserted into tether 72 to release or unlock tether 72 from cable 28 and allow adjustment of the length of cable 28. Substantially identical tethers 73, 75, 77 and 79 may also be used to form loops 68, 71, 81 and 78 in cables 24, 26 and 28 at the time of installation of the lighting fixture 10, as an alternative to preforming the loops.

**[0025]** First and second parabolic louvers or reflectors 14 and 16 are disposed in fixture housing 12 adjacent one another with lamps 18 and 20 supported between louvers 14 and 16 and top wall 34 of housing 12, as shown in FIG. 6. Each louver 14 and 16 is elongated and has a length generally corresponding to the length of the housing 12, as shown in FIG. 6. Louver 14 has first and second stringers 80 and 82 forming a parabolic shape in cross section, and louver 16 has third and fourth stringers 81 and 83 forming a parabolic shape in cross section. A first slot 84 is defined between stringers 80 and 82 for receiving a first lamp 18, and a second slot 85 is defined between stringers 81 and 83 for receiving a second lamp 20. Each louver 14 and 16 includes an open bottom 86 for directing light from lamps 18 and 20 downwardly. Each louver 14 and 16 includes a plurality of downwardly extending baffles 88 for further directing light downwardly. Louvers 14 and 16 are coupled in an adjacent arrangement by clips 90. Louvers 14 and 16 provide precise control of the light from lamps 18 and 20 downwardly. Louvers 14 and 16 are preferably made of highly reflective material, such as a mirror type material.

**[0026]** Socket holders 92 and 93 are inset from respective end walls or caps 40 and 42 and support both lamps 18 and 20 and louvers 14 and 16. Each socket holder 92 includes catches (not shown) for supporting louvers 14 and 16. End caps 40 and 42 may be connected to housing 12 via a fastener, such as a stud. Light seals or

gaskets may also be provided between end caps 40 and 42 and respective socket holders 92 to prevent leakage of light.

#### Assembly and Operation

**[0027]** Referring to Figs. 1 - 6, lighting fixture 10 is suspended from support 22 by engaging suspension cables 24 and 26 with suspension members 30 and 32, respectively. Loops 71 and 68 of cables 24 and 26 are first inserted into gap 60 (FIGS. 2 - 4) defined between tab 56 of each respective end cap 40 and 42 and top wall 34 of fixture housing 12. Each loop 71 and 68 of cables 24 and 26 may then be inserted into first and second slots 54 and 55 of the suspension members 30 and 32 and looped onto tongue 31. The tongues 31 and the gaps 60 allow for easy and secure engagement of suspension cables 30 and 32 with lighting fixture 10 without modifying or disassembling the fixture housing 12.

**[0028]** Once loops 71 and 68 of each cable 24 and 26 are securely retained on suspension members 30 and 32, ends 63 and 66 of cables 24 and 26 opposite loops 71 and 68 are coupled to support 22 in a conventional manner. For example, end 63 of cable 24 may extend around support 22 forming loop 81 with a tether 71 locking the loop in place, as shown in FIG. 1. The length of cable 24 may be adjusted by unlocking tether 71. Alternatively, end 66 of cable 26 may be screwed or bolted into support 22, as shown in FIG. 1.

**[0029]** For additional support of lighting fixture 10, suspension cable 28 may also be used. First end 66 is extended through suspension member or hook 62 in the central portion of fixture housing 12, thereby forming a loop 70. Tether 72 closes loop 70 and locks cable 28 in place. Second end 69 of cable 28 is then attached to support 22 in any conventional manner, such as the attachment between cables 24 and 26 and the support 22. Alternatively, cable 28 may extend around support 22 and form a loop 78 around cable 28, as shown in FIG. 1. Tether 79 is used to lock the loop 78.

**[0030]** Lighting fixture 10 may be installed by first engaging cables 24 and 26 with fixture suspension members 30 and 32 and then coupling each cable 24 and 26 to

support 22, as described above. Alternatively, cables 24 and 26 may be coupled to support 22 prior to engaging cables 24 and 28 with suspension members 30 and 32. For example, once cables 24 and 26 are secured to support 22, loops 71 and 68 of the first ends 67 and 64 of cables 24 and 26 may be looped around tongues 31. Suspension members 30 and 32 give the installer the option of either first coupling cables 24 and 26 with lighting fixture 10 and then suspending fixture 10, or coupling cables 24 and 26 with support 22 to suspend cables 24 and 26 and then coupling cables 24 and 26 with lighting fixture 10.

**[0031]** While a particular embodiment has been chosen to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made therein without departing from the scope of the invention as defined in the appended claims.